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Multifunctional War Robot

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ABSTRACT: Since the dawn of time, foot soldiers have engaged in battle and won the day for the winner. However, during the past several years, the role of the infantryman has evolved due to the advent of smart weapons and accurate aerial bombardment, forcing him into challenging urban combat conditions to neutralise any lingering opposition. The first of many projects like this to update infantry military gear is our system. Our system basically has two modes. One is the automatic mode, while the other is the human control mode. The automatic mode makes use of face recognition technologies to deter attackers. In some unavoidable circumstances, the user who can remotely control the robot's actions using a computer assumes control. Ability of our system to change modes rapidly and without lag time.

KEYWORDS: Foot soldiers, smart weapons, robotics, unmanned vehicles, sensors.

I. INTRODUCTION

Since the beginning, millions of individuals have lost their lives defending their country. Our project will attempt to solve the issue of developing a robotic system that can combat both invaders and combative situations. Our project's first stage is to detect the intruders who are breaking in using facial recognition technology. Our robot hunts down bombs and detonates them in addition to fighting. It can also scale walls and other obstructions. Our robot has the ability to locate the fire and spread it. This project will bring about a revolution in the infantry. Robotics in particular and engineering in general have advanced significantly. Numerous robotic systems have been created for a range of purposes. Some technologies that are used for automated vehicle movements on the road and wheel chairs can aid disabled individuals. There are other robotic weapons that can be used for defence. In addition to these advancements, combat-capable robotic systems are available for use in times of conflict. The robot is called "Security Warrior" and features five systems, including vision, mobility, robot arms, power estimation, and remote supervision.

II. RELATED WORK

Unmanned multifunctional robot zigbee adopter network for defence application [1], The robot is remotely controlled by a computer from another site. Zigbee Technology, a cutting-edge technology, is used to transport data to the computer. When a computer delivers control signals, Zigbee is utilised to convey them. The CMOS camera in this system is used to keep an eye on the robot. The video signals from the camera are received by the video receiver. The microcontroller is responsible for all control. The list also includes live human body detection, bomb diffusion, pressure gun, and gas leak detection, and live human body detection. This system has temperature sensing, which is done by keeping track of the ambient temperature, and the robot can navigate tough terrain.

Robots for surveillance in military applications [2], The Xbee transceiver receives the signal supplied by the transmitter after being picked up by the receiving antenna. The signal is transmitted to the microcontroller unit using the Xbee. The microprocessor instructs the motors to carry out specified mechanical movements, such as moving forward, backward, left, or right, in accordance with the directions it receives from the transmitter. There is also a PIR (passive infrared

sensor) sensor, which alerts the controller if it detects any human activity near the receiver. The camera on the receiving side wirelessly transfers the signal or feed to the portable TV through the antenna.

Wireless Surveillance Robot with Motion Detection and Live Video Transmission and Gas Detection [3], Robots can adapt to environments that people cannot enter. Any unstructured environment can also use it to identify motion. Due to the robot's metal detector, gas sensor, and fire sensor, any harmful gas or smoke in the area must be brought to the user's attention.

Bluetooth Technology Based Wireless War Field Robot with Night Vision Camera was developed [4]. The creation of a robot that would act as security in military and combat scenarios is the project's main objective. In the real world, there are many situations that people are unable to resolve, such as bomb detection, etc. Robots must be utilised in these situations. It is extremely safe and risk-free. This project is based on the concept of radio frequency control of a robot for gesture applications. Our design has a night vision camera and is remotely operated. Due to its attachment to the tank, the camera in this will move with the surroundings. TVs can show footage captured by cameras, and robots can record video remotely.

III. METHODOLOGY

1. Research of the hardware components of the project
2. Applying hardware model simulations.
3. Software evaluation for the project.
4. The use of computer programming.
5. Installing hardware components.

1. PIC18F452 MICROCONTROLLER

Computers that can sense and control the physical world better than your desktop computer can be built with the PIC18F452. A programming environment for creating programmes for the microcontroller board is part of this open-source physical computing platform.

By using a number of switches or sensors as inputs and a range of lights, motors, and other physical outputs as controls, PIC Controllers can be utilised to create interactive things. PIC projects can function both on their own and in combination with applications like Max MSP, Processing, and Flash. The boards can be manually put together or purchased already put together, and the open-source IDE is available for free download. Wiring, a comparable physical programming language, is implemented by the embedded c programming language.

2. DTMF DECODER

DTMF (Dual Tone Multiple Frequency) is currently the most popular and recognised telecommunication signalling method. A DTMF decoder listens for the DTMF tones when a key is pressed on a DTMF keypad and generates the binary sequence that corresponds to it. The circuit for this project is a DTMF decoder, and it is provided below. Nearly all mobile and landline phones have DTMF keypads. To determine the caller's dialled number, telephone switching centres use DTMF decoders. The DTMF variation used in push-button phones is known by the moniker "touch tone" and is an AT&T registered trademark power supply.

3. ULTRASONIC SENSOR

An ultrasonic sensor is a piece of machinery that uses ultrasonic sound waves to detect the distance to a target object and transforms the sound that is reflected back into an electrical signal.

4. PIR SENSOR

Due to its ability to detect motion, PIR sensors are almost solely used to determine if a person has entered or departed the sensor's field of vision. They are reasonably priced, low-power, simple to operate, sturdy, and lightweight. They are frequently found in furnishings and gadgets used in homes and workplaces for this reason. They are frequently referred to as PIR, pyroelectric, passive infrared, and IR motion sensors.

5. METAL DETECTOR

The search coil of a metal detector transmits an electromagnetic field into the ground to locate metal. Any metallic items (targets) will energise the electromagnetic field and emit an electromagnetic field of their own. The search coil of the detector picks up the retransmitted field and notifies the user by generating a target response. Metal detectors used in mine labs have the ability to discriminate between several target kinds and may be adjusted to ignore undesired targets.

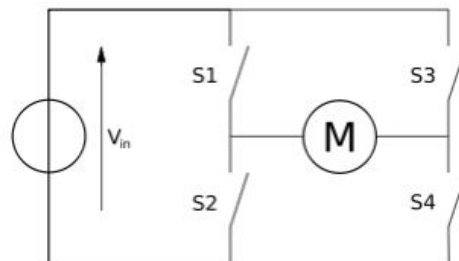
6. GPS MODULE

No matter where it is, a GPS receiver can determine its precise location using a constellation of satellites and ground stations. These GPS satellites provide information signals to the receiver using radio frequency (1.1 to 1.5 GHz). A ground station or GPS module may identify its location and time using the data it has received.

7. L293D MOTOR DRIVE IC

It is possible for DC motors to operate in either direction thanks to the L293D common motor driver or motor driver integrated circuit (IC). Two DC motors may be controlled simultaneously and in either direction using the 16-pin IC L293D. Therefore, a single L293D IC is capable of managing two DC motors. motor driver integrated circuit with two H-bridges. The l293d may also be used to drive big, silent motors.

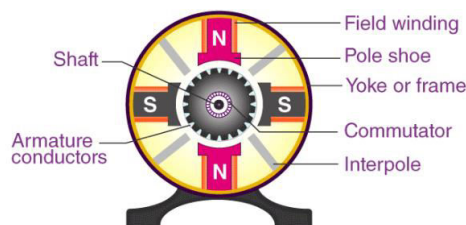
The quadruple high-current half-H driver L293D has an operating voltage range of 4.5 to 36 volts and can deliver bidirectional driving currents of up to 600 mA. It is intended to drive a range of inductive loads, such as high current/high voltage loads in positive supply applications, relays, solenoids, dc and bipolar stepping motors, and relays. Every single input supports TTL.



(H-bridge technique)

8. MOTOR

A direct current (DC) motor is a type of electrical appliance that transforms electrical energy into mechanical energy. According to the definition provided above, a DC motor is any electric motor that runs on direct current, or DC. We shall study a DC motor's design and its mechanism for transforming the electrical energy it receives from a DC source into mechanical energy.



DC motor construction parts

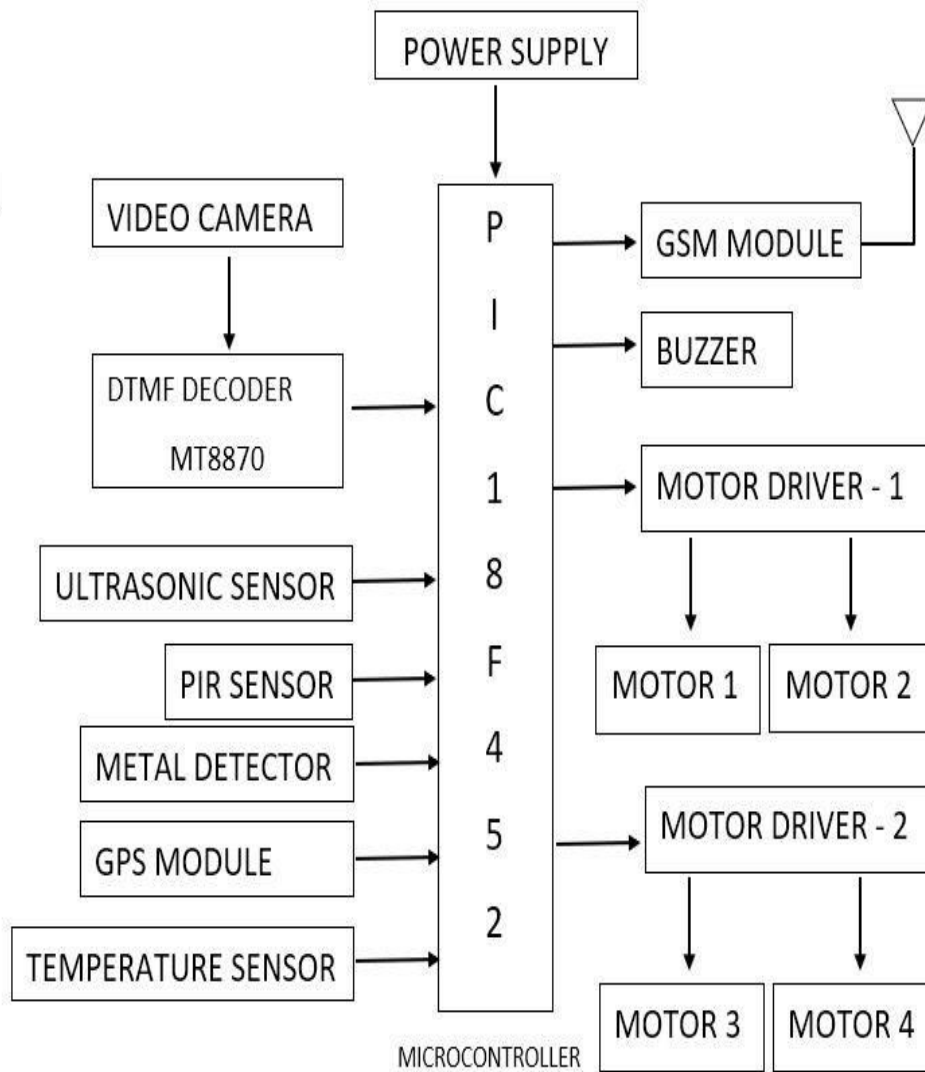
Rotor or Armature

The DC motor's armature is a cylinder made of magnetic laminations that are isolated from one another. The armature's axis and the cylinder's axis are parallel. The air gap between the armature and the field coil allows the armature to revolve about its axis. Or a Field Coil, Stator

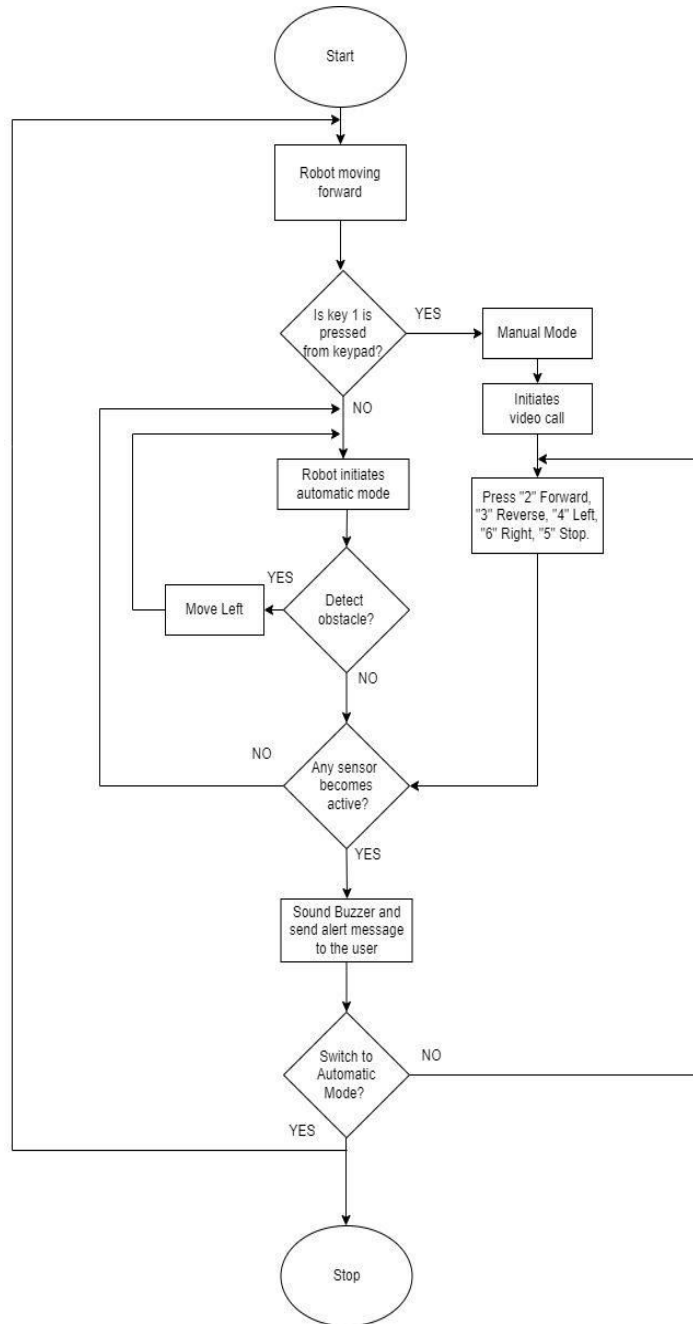
9. BUZZER

When the magnetic field is strong, the flexible ferromagnetic disc is drawn to the coil; otherwise, it returns to its initial location. The buzzer shifts the disc's magnetic field by pulsating the signal via the coil. The buzzer sounds in response to this motion.

IV. BLOCK DIAGRAM



V. FLOW CHART



VI. ADVANTAGES

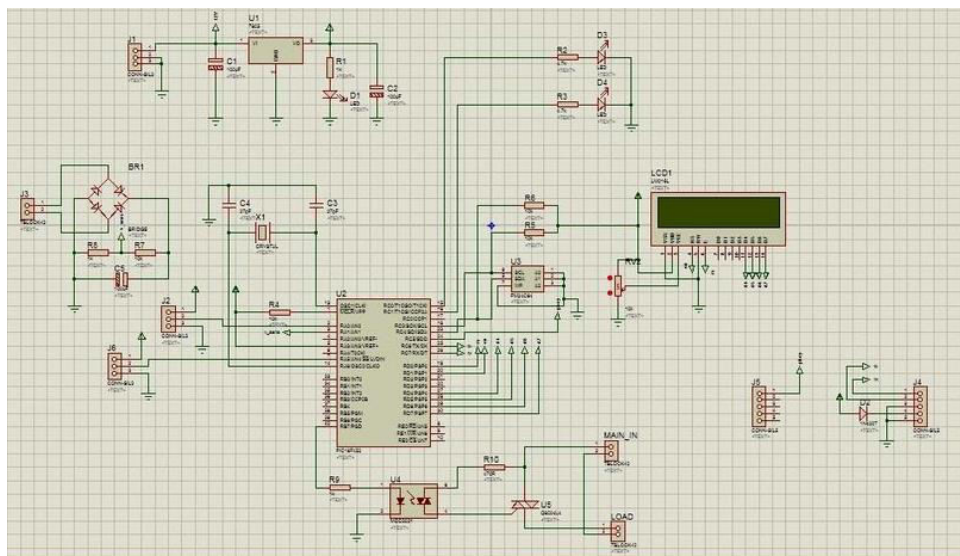
1. Wireless management.
2. System for surveillance.
3. Using Internet of Things technologies for vehicle navigation.
4. Makes use of the almost universally accessible mobile technologies.

VII. APPLICATION

1. Military activities.
2. Borderline surveillance.
3. a search-and-rescue effort.
4. Manoeuvring in risky situations.

VIII. EXPERIMENTAL RESULTS

The following technologies are achieved successfully the Users can learn how to construct an Android application-controlled robot with a wireless camera that can see in the dark by using this project, as well as how to design Android applications. The mobility component of the robot was carefully planned. The camera's output was advantageous in this regard because all of the project's objectives were successfully attained with excellent precision.



IX. CONCLUSION

We successfully implemented the working of the project through a simulation software. There is, however, always room for development. The robot might have extra features to increase its usefulness. A bomb defusing device and gas sensors might be added to the robot to improve it.

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